



ARTS3872

A YX]U'Di V`]Wg

HYfa `H\`fYY`##`&\$%-

7 ci fgY`Cj Yfj]Yk

`GHUZZ`7 cbhUW`i8YHJ`g`

`7 cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj`]m	@cWUj`cb	D\cbY
A UfmNci fbUnj	a "nci fbUnj]4 i bgk "YXi "Ui	A cbXUm' da !(da ž Hi YgXUm %%Ja !%&da	A 6`%*(

GW\cc``7 cbhUW`i`bZcfa Uhjcb

GW\cc``cZGcWU`GWYbWg

F cca`%) -

A cfj Yb`6fck b`7 &\$

Ya Uj`.g`cg4 i bgk "YXi "Ui

d\cbY. '\$&`-`' ,)`% \$+

7 ci fgY'8YHJ]`g

7 fYX]hDc]bqg '*`

Gi a a UfmcZ\hY'7 ci fgY

'Gi V'YW\hUfYU. 'GcW]c`c[mUbX'5b\hfcdc`c[m

⊕'h]g'Vēi fgYžmēi 'k]''YI d'cfY'VfcUX'gcW]c`c[]W]''UbX'Ub\hfcdc`c[]W]''i bXYfghUbX]b[g'cZa YX]U'UbX
hYcf]Yg'cZdck Yf'UbX'_bck`YX[Y'h.UhYI]gh]b'h.Y'di V']Wgd\YfY'UbX'gcW]U''ZY''6m]bHfcXi W]b['mēi 'hc
X]ZYfYbhk Umg'cZ\hYcf]g]b['a YX]U'dfUW]Wgžh]g'Vēi fgY'dfYdUfYg'mēi 'Zc'f'hY'UbU'ng]g'cZ\hY'WXUb[]b[
a YX]U''UbXgW]dY'UbX'bYk 'Zcfa g'cZgcW]U''ZY'']b['UbX'dc di 'Uf'W' 'h fY''Hcd]Wg'UfY''_Y'mhc'']bW] XY.]XYUg
cZa Ya cfmž'h]a Y'UbX'hY'W]bc`c[nž'hY'gcW]U''fY'U]h]cbg\]d'VYrk YYb'fēi V']W]U'UbX'fēi]j U]h]f]j]b'hY'Vēb'hYI hcZ

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y'8UHŸ	Gh XYbh@YUfb]b[Ci hŸa Yg'5ggYggYX
K cf_Vcc_`	(\$i	&) #/\$#&\$%- '\$*.\$\$'DA	%ž&ž ž{
9ggUm	* \$i	&* #/0/#&\$%- '%%) - 'DA	%ž ž{

5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`K cf_Vcc_`

GHUfhXUHŸ.`

8YHU]`g. `K cf_Vcc_`YI YfW]gYg`k]`VY`i bXYfHU_Yb`]b`YWh fY`UbX`hi hcf]U`WUggYg"K YY_`Vmik YY_`YI YfW]gYg UbX`dYdUfUH]cb`cb`hY`_YmfYUX]b[`Zcf`hY`k YY_`hc`VY`fYWcfXYX`]b`hY`k cf_Vcc_`"H\Y`k cf_Vcc_`Wcbg]ghg cZ]b]WUgg`YI YfW]gYg`UbX`Yj U`i U]cb`Zca`k YY_g`&!`*žUddfai`"`) \$!&, \$`k cfXg`k YY_`m"Gh XYbhg`k]` fYVW]j`Y`ZYXVUW_`]b`k YY_`(` `UbX`h`g`ZYXVUW_`k]` []`Y`h`Ya` `U`XYHU]`YX`X]gW`gg]cb`cZ`hY]f`dfc[fYgg`UbX`UfYUg`Zcf`]a`dfcj`Ya`Ybh]b`hY`k cf_Vcc_`

5XX]h]cbU`XYHU]`g.

8YHU]`g`Zcf`hY`k cf_Vcc_`UbX`UW]j`]h]g`hc`VY`UXj`]gYX`]b`hY`Z]fgh`YWh fY`UbX`hi hcf]U`WUggYgž`UbX`hY`XYHU]`g`k]`VY`Uj`U]UV`Y`cb`A`ccX`Y`"

5ggYgga Ybh&.`9ggUm

GHUfhXUHŸ.`

8YHU]`g. `H\Y`YggUm]g`XYg][bYX`Zcf`gh`XYbhg`hc`fYj`]k` `UbX`gY`YWhU`_YmUfYU`cZ]bhYfYgh`#cd]WZca` `hY`Wci`fgY`UbX`fYZYWhcb`hY`gcW]U`]]ggi`Yg`cZa`YX]U`UbX`W`hi`fU`]]Z`"K`cfX`Yb[`h`&ž`\$\$!`\$\$\$`k`cfXg`"H\Y`YggUmik`]`VY`Xi`Y`Uh`hY`YbX`cZ`hY`Wci`fgYž`h`]g`k]`VY`hY`Z]bU`UggYgga`YbhHUg_`Zcf`UggYgga`Ybh`di`fdcgYg`Gh`XYbhg`k]`fYVW]j`Y`k`f]hY`b`ZYXVUW_`UbX`U`bi`a`VYf]W]`a`Uf`_k`]h`]b`hY`b`k`cf_]b[`XUm]cZ`hY`gi`Va`]gg]cb`"H\Y`fi`Vf]Wg`YY`hk]`VY`Uj`U]UV`Y`hc`gfi`XYbhg`Uh`hY`g]hUfhcZ`hY`Wci`fgY`gc`h`YmW]b`k`cf_`hc`k`UfX`gdYW]Z]Wgh]bXUfXg`

5XX]h]cbU`XYHU]`g.

8YHU]`g`Zcf`h`g`UggYgga`Ybhk`]`VY`Uj`U]UV`Y`]b`WUgg`UbX`cb`A`ccX`Y`"

5 hYbXUbW F Yei]fYa Ybhg

Gh XYbhg UfY gfhcb [mYbWci fU[YX'hc UhhYbX'U''WUggYg UbX'fyj]Yk ''YWh fy'fYWcfX]b[g"

7 ci fgY'GWXYXi `Y

[J Yk WUgg'ha YhUVY](#)

H]a YhUV`Y`

8UhY	HmdY	7cbhYbh
K YY_%`%*`GYdhYa VYf! &\$`GYdhYa VYf	@YWh fy	hfcXi Wjcb'hc`A YX]U`Di V`]Wg
K YY_&.`&`GYdhYa VYf! &+`GYdhYa VYf	@YWh fy	HCD=7.`D9F 79DH€B
K YY_".`"\$`GYdhYa VYf! (`CWhcVYf	@YWh fy	HCD=7.`A 9A CF M5B8`H<9`A CJ -B; `A 5; 9
K YY_(.`+`CWhcVYf!`%% C WhcVYf	@YWh fy	HCD=7.`H# 9
K YY_)`.%(`CWhcVYf!`% C WhcVYf	@YWh fy	HCD=7.`D<CHCG`5B8`"@= 9.` 9J 9F MB5M9LDF 9GG€BG`C: `H<9`G9BG9G
K YY_*.`&%CWhcVYf!`&) C WhcVYf	@YWh fy	HCD=7.`8C 7I A 9BH-B; `H<9`F 95@
K YY_+.`&`,`CWhcVYf!`% Bcj Ya VYf	@YWh fy	HCD=7.`8 ÷ #5 @F 95 @H-9G. `D9F 79DH€BG

		: FCA 'BCB!<I A 5B '@= 9
K YY_ ; . ('Bcj Ya VYf! ; Bcj Ya VYf	@YWh fy	HCD=7 . '7F -G-G '5B8 'H<9'J -GI 5@
K YY_ - . %%Bcj Ya VYf! %) 'Bcj Ya VYf	@YWh fy	HCD=7 . '5DDF C 57 < -B; 'F 95 @+HM
K YY_ %\$. % 'Bcj Ya VYf! &&'Bcj Ya VYf	@YWh fy	HCD=7 . 'K < =7 < : I HI F 9 'C: 'G99-B; 3

F Ygci fWg

DfYgW]VYX F Ygci fWg

MCI AI GHDI F7<5G9'H<9'7CI FG9'GHI 8M? #I: FCA 'H<9'I B=9FG#IM6CC? 'G<CD

H<9'7CI FG9'GHI 8M? #I#B7@ 89G'F958#; G'5B8'7CI FG9'G7<98I @9

D@95G9'6F #; 'H<9'7CI FG9'GHI 8M? #I'HC'9J9FM@97HI F9'5B8'HI HCF #5@'7@5GG

F YWca a YbXYX F Ygci fWg

5@@: #A G'G7F99B98' B'H<9'7@5GG'K @@'69'5J5 #56@9'H<FCI ; <'H<9'I BGK '@6F5FM
GHF95A #; 'G9FJ #79G'CB?5BCDM

7ci fgY'9j U'i Uh]cb'UbX'8Yj Y`cda Ybh

K Y'k]`Yb[U[Y']b']bZcfa U`UbX'Zcfa U`ZYXVUW`'a YWUb]ga g'k]`VY`ja d'Ya YbHYX'hc \Y'd'Yj U'i UHY`hY
VYghHYUWX]b['dfUW]W`h'fci [\ci h'hY`Wci fgY"

Mci f'Yj U'i Uh] Y`ZYXVUW`'jg[U'hYfYX'dYf]cX]W`mi g]b[žUa cb['chYf'a YUbgžI BGK f]g`Wci fgY`UbX
HYUWX]b['9j U'i Uh]cb'UbX`#a dfcj Ya YbhfA M9I dYf]YbW`Ł'dfcW`gg" #Zcfa U`ZYXVUW`'UbX`WUgg!
[YbYfUHYX'ZYXVUW`'UfY`U'gc`ja dcfUbhž'UbX'hYgY'ZYXVUW`'a YWUb]ga g'UfY`\Y'dZ`'hc'a m'Wcb]bi U`
XYj Y`cda Ybhczh]g`Wci fgY" Mci f'ZYXVUW`'jg'j Yfm]a dcfUbh'hc'a Y`UbX`#i gY`mci f'ZYXVUW`'hc
Wcb]bi U`mi dXUHY`h]g`Wci fgY'! Zcf'YI Ua d'Y`Zca`'UghmYUff]g'ZYXVUW`'=#Uj Y`fYcfXYfYX'hY'ghfi W`i fY`cZ
hY`YW`i fY`hYa Yg'UbX`UXXfYggYX'gca Y`cZhY`UggYgga Ybh]ggi Yg'hc \Y'd'ghfYUa`']bY`UbX`ja dfcj Y`hY
Wci fgY`Zcf`&\$%-`"=#hUb`_mci`Zcf`mci`f`h]a Y`]b`hU`_]b['hc`VY`]bj`c`j YX`]b`hY`ZYXVUW`"

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]h]b`Gi Va]gg]cb

≠mci`YbWci bhYf`U`dfcV`Ya`k`Yb`U`H`Ya`dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`h`fci`[`\`Hi`fb]h]b`z`d`YUgY`
H`Y`d`cb`Y`9I`H`fb`U`Gi`ddcfh`cb`-`,`)`'`'`'`%`cf`Ya`U]`h`Ya`cb`YI`H`fb`U`H`hgi`ddcfh`4`i`bgk`"YXi`"Ui`"Gi`ddcfh`
`ci`fg`UfY`,`.\$\$Ua`-`%\$.\$\$da`cb`k`YY`XUmg`UbX`-`.\$\$Ua`-`).\$\$da`cb`k`YY`YbXg`f`l`*)`XUmg`U`m`Y`Uf`l`"≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`Xi`Y`hc`U`Z`U`h`k`]h`Hi`fb]h]b`mci`a`Um`Udd`m`Z`f`Ub`YI`H`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mci`f`h]W`Y`hbi`a`VY`f`Z`ca`9I`H`fb`U`Gi`ddcfh`f`U`cb[`k`]h`Ub`mc`h`Y`f`f`Y`j`Ub`h`X`c`W`a`Y`b`h`g`l`hc`
]b`Wi`XY`Ug`Y`j`]X`Y`b`W`hc`gi`ddcfh`mci`f`YI`H`bg]cb`Udd`]W`h]cb`"≠mci`Ya`U]`9I`H`fb`U`Gi`ddcfh`mci`k`]"`

5 WUXYa]W<c bYghmiUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b[`h`Y`k cfXg`cf`]XYUg`cZc`h`Yfg`UbX`dfYgYbh]b[`h`Ya `Ug`mci f`ck b" `h`WUb`hU`Y`a Ubm
Zcfa gž`Zca `XY`]VYfU`h`W`Y`U`h]b[`h`U`W`Y`X`Y`b`U`m`W`c`d`m]b[`Zca `U`gci f`W`k`]h`ci h`U`W`_`b`c`k `Y`X[`Y`a `Y`b`f`

I BGK `[fci dg`d`U[]Uf]ga `]b`h`h`Y`Zc`ck]b[`W`U`h`Y`[cf]Yg.

7 cdm]b[.`i`g]b[`h`Y`g`U`a `Y`cf`j`Y`f`m`g]a]U`f`k`cf`X`g`h`c`h`Y`cf][]b`U`h`I`h`cf`]X`Y`U`k`]h`ci h`U`W`_`b`c`k `Y`X[]b[`h`Y`

- i bXYfghUjX'mci f'f][\hg'UbX'fYgdcbg]V]h]Yg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wc'dmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'UjX'5W'W'dhUV'Y'I gY'cZ I BGK '⇒H'F'Ygci f'W'g'Dc`]W'h
- VY'Uk UfY'cZ'Y'ghUjX'UfX'g'cZVY\Uj]ci f'YI dY'W'X'cZYj Yfmc'bY']b'Y'Y'I BGK 'W'a a i b]m
- `cW'W'h'gYfj]W'g'UbX']bZ'c'fa U]cb'UVci hi BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'Y'gY'UfY'Ug'k]`VY'ZJa]]Uf'hc'mci ž'c'h'Y'fg'k]`VY'bYk "; U]b]b['U'gc`X'i bXYfghUjX]b['cZU`'h'Y fY'U'Y'X'UgdY'W'g'cZ9@G9'k]`'Y'd'mci 'a U_Y'h'Y'a cgh'cZ'mci f'gh X]Yg'Uhl BGK ""

[\h'c.##j' V'Y'W'f' i \]X'Y'g"\]V'f'U'f'm'i b'g'k "Y'X'i "U'i #' \]g'Y'#U'V'c'i h' \]g'Y](#)

